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ABSTRACT

This handbook is intended to help educational evaluators use still photography in designing, conducting, and reporting evaluations of educational programs. It describes techniques for using a visual documentary approach to program evaluation that features data collected with a camera. The emphasis is on the aspects of educational evaluation dealing with questions about what transpires in the program. How useful photography is to evaluators may be viewed as a function of how important they think descriptions and interpretations of program operations and activities are rather than learning outcomes. The descriptions of events, activities, and social interactions in a program represent pictures of the social organization of the curriculum and learning conditions. Attention is also given to problems of various threats to validity and sampling plans. (Author/GK)

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Research on Evaluation Program

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No. 63 HANDBOOK IN EVALUATING
WITH PHOTOGRAPHY

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ROLM Corporation

August 1981

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PREFACE

The Research on Evaluation Program is a Northwest Regional Educational Laboratory project of research, development, testing, and training designed to create new evaluation methodologies for use in education. This document is one of a series of papers and reports produced by program staff, visiting scholars, adjunct scholars, and project collaborators--all members of a cooperative network of colleagues working on the development of new methodologies.

How does one collect photographic information for use in evaluations? What are the major technical and procedural issues of concern in doing such studies? This report provides assistance in designing, conducting, and reporting evaluations using a visual documentary approach, featuring the use of still photography. It covers a wide range of both practical and methodological concerns in using photography in evaluation.

Nick L. Smith
Editor, Paper and Report Series

ACKNOWLEDGEMENT

The Research on Evaluation Program at the Northwest Regional Educational Laboratory has examined some twenty models outside of educational psychology that use alternative methods applicable to educational evaluation. The work on photography in evaluation described in this handbook is one of those alternative models. This handbook was prepared for the Research on Evaluation Program, Nick L. Smith, Director. It was funded by the National Institute of Education, U. S. Department of Health, Education, and Welfare.

I am indebted to numerous people for their criticism and support: Howard Becker and Rob Walker for sea changes and navigation skills; Barbara Schonborn, Michael Sawdey, Sara Todd, and Diane Rinehart for keeping me out of shallow water; Nick Smith for charting the course of this work. The tidal patterns were long ago established in CIRCE by Tom Hastings, Gordon Hoke, Ernie House, Harry Broudy, Jo Day, Bernadine and Bob Stake.

Woodside, California
July 1, 1981

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Introduction

This handbook is intended to help educational evaluators use still photography in designing, conducting, and reporting evaluations of educational programs. It describes techniques for using a visual documentary approach to program evaluation that features data collected with a camera. In this handbook, photograpny refers to still photography, particularly black and white photographs.

Faced with ever-increasing pluralism, with the current requirements for accountability, and the problems of limited resources--decreasing revenues, declining enrollments, shrinking programs, aging teachers, and more heterogenous student bodies--evaluators are assuming more responsiblity for using descriptive and qualitative methods of doing evaluation, rather than strict treatment and experimental control designs that seek specific causes and effects. More and more, the central questions asked are about how programs operate and what their purpose is, rather than what their outcomes are. Questions like these are asked:

What is the current state of affairs?

What does the program look like to different people?

What is the shared educational experience?

What is the daily experience of students and teachers?

What goes on here?

This shift in questions is accompanied by a shift in methods of approaching evaluations--from causal to non-causal models. I am referring to the increase in the use of multiple methods, case studies, photographic documentaries, and other descriptive approaches. The plentiful supply of models given to qualitative methods attests to the interest and willingness among evaluators

to consider new methods for solving evaluation problems. Various qualitative approaches are associated with responsive evaluations (Stake, 1978a): case study (Stake, 1978a, 1978b), noncausal inquiry (Smith, 1981), field work (Burnett, 1973; Smith, 1978), naturalistic inquiry (Guba and Lincoln, 1980), educational connoursiership (Eisner, 1979), and thick description (Geertz, 1973). The general trend integrates multiple methods of observation and interviewing for collecting data, and plausible inference and logical analysis for interpreting data.

In addition to the shift in emphasis from causal to noncausal models, more attention is being given now to the impact of evaluation results on policy decisions, and their influence on improving instructional programs. A chief concern is with not only the quality of evaluation evidence but also effective ways of presenting reports to decision makers. Documentary photography is one of the variety of alternative qualitative reporting styles being considered. Visual information used by evaluators provides one form of program knowledge in response to these practical concerns about the quality of methods and evidence.

Evaluators generally have had limited experience in using photography for purposes of program evaluation. Few have been trained in its use. Some evaluations have been made in which photographs are a prominent form of evidence; they are cited throughout this book. Many disciplines have used photography in research and evaluation: archeology, medicine, physiology, zoology, botany, and psychology, to name a few. The major contributions to the methodology of documentary social inquiry have come mainly from photo-journalists, sociologists, and ethnographers. These people have developed a variety of systematic methods for using a camera as a research and evaluation tool. The approach adapted here for program evaluation comes mainly from the traditions of visual anthropology, visual sociology, and documentary photography, utilizing methods of participant observation.

What are the practical considerations involved in developing and carrying out an evaluation using photography? A sound method of photographic inquiry contains at least ten elements, all of which will be described in this handbook:

- Deciding when to use visual information
- Planning photographic techniques
- Selecting the photographer(s)
- Identifying program issues
- Selecting a sampling method
- Dealing with reactivity
- Collecting the data
- Establishing validity
- Interpreting the data
- Reporting evaluations using photography

Deciding When to Use Visual Information

Photography is about communication. Photographs may tell a story or illustrate one. Evaluators may use series of photographs to communicate a story in an appraisal of a program or to reinforce valuations by illustrating (House, 1980). Evaluators are choosing to use photography in a variety of situations. Following is a listing of conditions when evaluators might choose to use photography for

- a record of events in detail
- close-up work with program participants
- visual information that is of primary interest
- tracking the activities of a single participant in the program
- thick description of the process in a program rather than outcomes

- information about how the program looks different to various people
- documentation of the context of the program
- a record of information about social interaction of particular individuals, groups, or communities
- evaluating the daily conditions in the program
- documenting regular routines of regular and special classes or programs
- descriptions of particular learning media
- answers to a variety of questions that can be asked
- an interdisciplinary effort that is developing, each asking different questions
- plausible interpretations rather than explanations
- designs that are flexible
- activities rather than goals of the program
- understanding the subjective nature of the participants' experience
- discovering the unexpectd, unobtrusive, secondary effects of the program
- looking at a set of social relationships

Planning Photographic Techniques*

Introduction

This section contains a discussion of various technical aspects of photography in evaluation. The procedures used in several studies are described, as are the reasons for choosing them. Alternatives that might work as well as the most desirable procedures do are included. Also included in a description of the qualifications the photographer(s) should have.

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*I wish to express thanks to Michael Sawdey and Adrianne Bank for their contributions to this section.

Equipment

The vast majority of photography in evaluation is done rapidly, unobtrusively, and in available light. It involves taking a large number of pictures. The conditions more or less require that the photographs be taken with 35mm equipment, most often with the ubiquitous single-lens reflex camera. Whatever camera is used, it will need to have a lens with an aperture of at least f.2.8. to permit available light photography in average office and classroom lighting.

In the evaluation of the Evaluation Network Conference (Templin, 1979), the two photographers used 35mm single-lens reflex cameras (Miranda G and Olympus OM-1), taking most of the pictures with the "normal" 50mm lenses of these camera. A few shots (2-3% of the total) were taken with an 85mm "short telephoto" lens. This made it possible to examine details at a greater distance, but was certainly not essential. In that study, a wide-angle lens would have been useful in some situations. For example, as the conference progressed, one feature of the meetings that we sought to examine photographically was the buffer zone that develops between the presenter and the audience. Because of the limited space in the rooms, it was often difficult to include enough angle of view to show the extent and configuration of the buffer zone. A wide-angle lens would have helped. Again, this was not essential: by taking two or three successive shots from one vantage point and piecing the resulting prints together edge-to-edge, it was possible to provide a panorama of a room. Although this technique is less elegant than using a wide-angle lens, it has the advantage that it does not introduce distortion of distance or perspective. In this connection it must be remembered that wide angle lenses tend to exaggerate the apparent distance between objects arranged at different distances from the camera, whereas a telephoto lens tends to compress this distance. If one wanted to interchange the normal lens for telephoto, wide-angle, or close-up lenses, the single-lens reflex camera accommodates the other lenses.

The single-lens reflexes did not present any severe difficulties in collecting the data at the Evaluation Network Conference, although two considerations might be important under some other circumstances. First, this type of camera is relatively noisy, and thus tends to be obtrusive. Second, in extremely poor light the single-lens reflex can be difficult to focus. However, the lighting in the conference rooms was adequate for focusing. To overcome the problems of noise and the uncertainties of focusing in low light, some photographers prefer to use 35mm rangefinder cameras. Most of the moderately priced rangefinder cameras now available do not take interchangeable lenses, and their fixed lenses generally have a slightly wider than normal angle of view. For most purposes these would not be significant drawbacks, and the use of compact 35mm rangefinder cameras for evaluation photography should be explored.

Photographic Materials and Processing

It is not usually necessary to use ultra-high-speed films for evaluation photography. A film with an ASA speed of 400 (such as Kodak Tri-X or Ilford HP-4) is sufficiently fast for photography in ordinary room light, but will still provide fine-grained photos that will enlarge well. Likewise, there is no need to use exotic developers in the darkroom. Standard developers (such as Kodak D-76 or Agfa Rodinol) are inexpensive and provide plenty of speed and contrast for the purposes of evaluation photography.

At the Evaluation Network Conference, the photographs were taken with Kodak Tri-X film, using exposures determined for the normal speed of this film (ASA 400). The available light in the conference rooms required exposures ranging from 1/30 second at f2 in the dark corners to 1/60 second at f4 in the brightest areas. Most classrooms and office areas would probably be somewhat brighter than the brightest parts of the conference rooms, so it would seem that availability of light would not normally be a problem in evaluation photography.

In evaluation photography it is usually necessary to develop and print pictures daily, as detailed later in this section.

This is not as difficult as it sounds, even if there is no darkroom immediately available. Film can be loaded into developing tanks in room light by using a changing bag. A darkroom for printing can be set up in almost any bathroom that can be more or less darkened. A compact enlarger can be carried in a suitcase, plastic chemical trays lined up in the bathtub, and prints made on resin coated paper that requires no special equipment for drying.

The photographs taken at the Evaluation Network Conference were developed in this sort of temporary darkroom. Film was developed in Kodak D-76 developer, allowing development times about 10% longer than those recommended by the manufacturer. This provides a slight increase in contrast and helps show more detail in the shadows; both of these factors make it easier to examine fine details in the completed photographs. "Push processing" to increase the light sensitivity of the film was not used becsuse there was adequate light to expose the film normally, and because pushing film increases the graininess of the resulting photos--again, obscuring detail. Other aspects of the film processing were normal, except that the film was occasionally dried with a blow-type hairdryer to speed processing time. In cases where film must be processed very rapidly, the following steps can be taken: 1) use rapid fixer; 2) soak film in hypo eliminator to reduce washing time; 3) dry film instantly by dipping in film drying solution (a volatile solvent that displaces the water from the surface of the film).

All negatives were contact-printed on 8x10 inch photographic paper and, after selection of frames to be enlarged, 8x10 enlargements were made. Because of methodological considerations, the entire frame was always enlarged. This results in a print with wide borders on its long sides, since the proportions of the 35mm frame (24 x 36mm) are different from those of the standard 8x10 photographic paper. All prints were made on resin-coated paper (in this case, from Ilford, although similar papers are made by Kodak, Agfa, and all other major manufacturers). Resin-coated papers do not absorb water; thus

they process and wash more quickly than conventional papers and they can be dried without special equipment by simply hanging them up with clothespins. For processing in the field, these advantages outweigh the fact that resin-coated papers are somewhat more expensive, have slightly less range of gray tones, and are less stable in archival storage than conventional photographic papers. Glossy paper was used because the surface texture of matte papers may sometimes obscure detail in a photograph.

Many of the photographs taken at the conference were also made into black-and-white slides. This is a very simple process: the negatives are contact printed on positive print film in the darkroom. This Kodak product is a very slow (ASA 4) 35mm film which can be handled in the darkroom under a red safe-light and developed in the developer normally used for photographic prints (e.g., Dektol). The positive print film was cut into strips a little longer than the strips of negatives and then the negatives and print film were sandwiched together under a piece of glass and exposed briefly under the enlarger. With practice, one can perform this process rapidly and readily produce a large quantity of slides for projection and examination.

After the strips of film were fixed, washed, and dried, they were cut apart into individual frames and mounted in Pako one-piece plastic slide mounts. These mounts are considerably easier to use than two-piece plastic mounts, or cardboard mounts that must be heat-sealed.

All darkroom work was successfully performed in a motel bathroom, indicating that there should be few problems in processing black-and-white film and making prints and slides "on location". A changing bag was used for loading film into the processing tank. This procedure is recommended because it may be difficult to make a room dark enough for film handling, although the motel bathroom was sufficiently light tight for making prints and slides. When working under time constraints, the major processing bottleneck proved to be the 4-roll film tank. It is

recommended that a larger tank (e.g., 8- or 10-roll capacity) be used to sped processing.

Record Keeping

If still photography is to be used seriously for evaluation purposes, it is essential that complete records be kept during data collection. During the Evaluation Network Conference, the photographers used a newsprint pad and felt-tip pen to record the date, time, location, and subject matter, together with a roll number assigned to each roll of film. This newsprint page was then photographed at the beginning of the roll, and at every change of subject matter or location a new sheet was written up and photographed.

After processing, 35mm negatives are commonly cut into strips of six exposures each, since this length fits conveniently onto an 8x10 sheet of photo paper for contact printing. The strips from each roll were placed in a film storage envelope and identified with the number of the roll, taken from the newsprint sheets photographed on the roll.

Each roll of 35mm film is marked at the factory with frame numbers along its edge. Thus, when the film from a roll is contact printed, it is possible to arrange the strips of negatives in the order in which they were exposed. Before processing the contact sheet, the roll number was written on the back. In this way, each exposure on the sheet can be identified for future reference by referring to the roll number and frame number. We chose to represent this number as roll/frame, separating the numbers with a slash. Thus 9/32 = roll 9, frame 32.

When enlargements are made from the negatives, the roll/frame number is written on the back of the print. This makes it possible to return to the contact sheet, find the frame, find out what frames preceded and followed it, retrieve the information on date, time, place, and subject matter from the photo of the newsprint sheet, etc. Likewise, when a slide is mounted, the roll/frame number is written on the slide mount.

If the photographer or another observer is making field notes while photos are being taken, then the roll numbers should be entered in the notes. It may also be desirable to make notes on, say, the number of frames devoted to this or that item covered in the notes. This information can be expanded and elaborated later by going over the field notes while referring to the contact sheets of the photographs.

Work Output and Costs

In the Evaluation Network Conference evaluation the two photographers exposed a total of 19 rolls of film, or approximately 700 exposures, although the last three rolls were not developed until after the conference due to time constraints. From the contact sheets, about 200 photographs were selected for further study. Of these, about 50 were made into 8x10 enlargements and approximately 100 were made into black-and-white slides.

Total time spent in photographing during the first two days of the three-day conference was approximately 28 person-hours. Darkroom work required about 24 person-hours, and related operations, such as sorting and selection, record keeping, slide mounting, sequencing of slides and prints, etc., required another 10 person-hours.

Total cost of materials used in photographing the session, including film, chemicals, printing paper, slide film, and slide mounts, was approximately $55. However, this figure may eventually rise to about $75 because more prints and slides will be produced later for additional analyses.

By contrast, in an evaluation of computer literacy in non-school settings the costs were considerably higher. The commissioned photographer at $25 per hour and commercial laboratory processing of film and prints totaled approximately $800.

Selecting the Photographer(s)

Evaluators may wish to serve as photographers in their own studies. In some instances, it may make more sense to hire, and possibly retain, one or more photographers. Should evaluators wish to employ photographers to work with them, here are a few suggestions for selecting a qualified person.

Questions for interviewing prospective photographers could be based on the following considerations:

1. Visual sense
2. Technical competency
3. Philosophy about photography
4. Social competence

Visual sense. The photographer must have an aesthetic eye; that is, be able to frame a picture in both time and space. This ability to know what to photograph and when to close the shutter comes partly from training and partly from experience, but it does not come to every photographer. A competent, experienced photographer will very likely present a collection of pictures in a portfolio for the evaluator to examine.

Technical competence. Technical competence refers generally to the ability to set and focus the camera consistently and well. This skill is essential. Competence in darkroom techniques is also imperative unless the budget includes sufficient funds to have film and prints processed by a commercial lab. Of particular importance in the darkroom are speed, high standards of quality in developing and printing film, and efficiency. In evaluation work, there frequently is a large volume of film to handle in a short time. Humor under tension is related closely to technical competence because patience is required in producing work of high quality while collaborating with another person. A good balance of technical competence and aesthetic skill is highly desirable.

Philosophy about photography. The photographer should be experienced in documentary work. Social documentary photography requires the photographer to understand that collections of photographs rather than single pictures make the kinds of social statements appropriate for evaluation purposes. The viewpoint that a single photograph is a work of art is more appropriate when photos are used for illustration than when they are used as data. Having a documentary philosophy of inquiry is vital, coupled with a keen ability to observe, be analytical, and make connections between the factors in a social situation. Looking upon the camera as a research tool also implies the photographer knows something about the problems and methods of research and evaluation. This is especially important because in many evaluations the photographer will have to work fast.

Social competence. It is necessary in documentary work to interact with the participants in a program. Social skill under these circumstances determines to some extent the amount of trust that will be established between the photographer and the participants. A photographer with social intelligence is able not only to gather data of higher quality than a photographer without it, but also to relate to people with reassurance, empathy, and humor while still maintaining the critical perspective and objectivity required for documentary work.

Identifying Program Issues

The term "foreshadowed problems" refers to generally defined topics of interest that help anticipate what data are to be collected in the beginning of a study (Malinowski, 1922). They help focus the topic, organize the evaluation process, anticipate the important questions and issues that emerge, and guide the interpretation of the photographs. Using foreshadowed problems is a way of discovering what is occurring in a program so that the photographer does not go in unprepared. Foreshadowed

problems may come from several sources--the field, the literature, or theoretical knowledge.

When an evaluation plan is formulated for a study using photography, the evaluator selects some systematic approach to identifying what to study and photograph about the program. In particular, two approaches seem relevant to documentary photographic evaluation: one uses program issues, and the other uses telling theories. Program issues and telling theories function similarly: they provide a tentative understanding of what to expect by offering a viewpoint to either adopt or rule out in the course of the study, and they also suggest some specific events to photograph.

Identifying Issues

Program issues are those few questions used to structure the study of a particlar program; they are asked in the context of the specific program (Stake, 1980). They are related closely enough to the aims and concerns of the program constituents to provide vital understanding of the program.

On the other hand, telling theories are simple concepts or a set of concepts that are selected for their relevance to areas of concern about the program. They help identify what to photograph in order to develop an understanding of the program. They are useful for getting ready for the evaluation by anticipating some explicit problems and issues that may arise in fully describing and making judgments about the mechanics and operations of a program. Telling theories help direct evaluators to the issues in a program by drawing attention to the most important questions, the ones to which the evaluators should direct their efforts to find answers (Stake, 1978a).

Program issues and telling theories are held lightly: the photographer has to be willing to give them up or change them the moment that photographic information reveals something new that does not fit the interpretation. Otherwise, one may wind up with a large set of disorganized pictures that are hard to make sense

of. Worse yet, holding rigidly to prior issues and theoretical notions may lead the photographer to excessive coverage of items that turn out to be unimportant in the situation, at the expense of adequately reporting items that are important.

Selecting Telling Theories

Photographers have to know roughly what to take pictures of before they begin, and what to photograph next. There are too many things to photograph to be able to enter the evaluation situation without some preconceptions. When taking pictures for evaluation purposes, there may be a tendency in the beginning to photograph everything, including non-participants. This seems to be inevitable, and, in the interest of providing some margin for error, is not usually a cause for concern. Some things go by fast, take place simultaneously, or will never happen again. In other situations some things will be more stable. In any case, program issues and telling theories provide the initial guidance needed to begin taking pictures, without blinding the photographer to the unanticipated elements that emerge as the photographing proceeds.

The use of the term theory may conjure up suggestions of doing research rather than evaluation. The term is used here instead only to acknowledge the origins of the mental activity, interpretive in nature, that often lead evaluators to observe the kinds of events they do in their attempts to improve understandings of the program. These abstract contributions are likely to transform into more concrete issues during the course of the evaluation.

The selection of issues or theories for photo-assisted evaluation is not markedly different from that of studies utilizing other data collection techniques. It is necessary, however, that the questions raised by the issues or telling theory be ones that can be satisfactorily answered by photographic data. Such questions usually involve the interaction of persons with one another and with the environment, in both space and time.

Initially, the selection of telling theories arises from two types of information: existing data about the situation to be evaluated, and existing literature that provides more abstract ideas of potential descriptive utility. The selection of issues arises from data about the program's operation or that of similar educational programs. Existing information about the situation (outreach literature, program curricula, instructional plans, floor plans, activity schedules, etc.) can provide a sense of what the planners, administrators, teachers see in the situation, and what they expect to happen. Likewise, existing theoretical ideas can provide an initial sense of what is likely to happen in the situation, and what events may have significance. The questions one then asks--and attempts to answer with photographic evidence--guide attempts to either confirm or disconfirm aspects of the anticipated structure of the situation. First in tentative form, and then in modified form, both program issues and telling theories help shape the procedures for sampling, collecting data, and interpreting the results.

Selecting a Sampling Method

Traditional causal research methods assume that when one samples, one is drawing randomly from some population of possible cases. Deviation from the true nature of the defined population is referred to as sampling error, which limits the generalizability of findings to others in the population. In non-causal evaluations that use photography in describing and appraising programs, a different concept of sampling is used. Here, sampling emphasizes how representative the sample is of the population, and of the social and physical environment in which the program occurs. Generalizability to other programs is assumed to be more a matter of illumination, based on the reader's experience with and knowledge about similar programs (Stake, 1980; Parlett and Hamilton, 1977).

Sampling decisions are made to obtain photographs that fairly represent the events and participants in a program. One key idea is to represent the multiple perspectives of the various constituents in a program in both time and space.

Evaluators using photography attempt to answer three general sampling questions:

1. Is this photographic evidence representative?
2. Of what is it representative?
3. Whose differing perspectives are represented?
4. Does this sample of photographs represent to others the interpretation the evaluator intended?

While composition may imply what is important in a single picture, sampling implies what is important in a collection of documentary photographs. Collier (1967) claimed that sampling in photography connotes authenticity. The model of sampling applied in this photographic method is Glaser and Strauss' (1967) notion of theoretical sampling for purposes of generating explanations. Units of observation (categories of information or issues) are chosen because some emerging issues suggest they are strategic for understanding the data.

Social scientists in general deal with threats to the validity of assertions and inferences by applying various conventional sampling techniques that allow certain kinds of generalizations or plausible inferences to be made. Photographers may want to show their photographs in a way that implies generalizability, that what they say applies to a wider population. Some sampling techniques pertinent to photography include time sampling, checking up on people at regular intervals (minutes, hours, days, weeks, seasons), or sampling at intervals to get a full range of times and activities. Another sampling technique entails shadowing or following one person through an entire daily or other routine. A third approach is snowball sampling, asking each subject who else the investigator should talk to, and what else should be investigated, and photographed, letting one subject lead to another.

Using issues as a sampling device may direct the photographer's attention to things toward which the biases of interest or intuition might not otherwise lead them, things that indicate what might constitute a fuller description of the situation under study. Photographing certain activities or places following a plan counteracts the tendency to photograph only what appears personally interesting. Photographers may expose a roll of film every hour, for example. Techniques of randomization and theoretically informed sampling also might direct the photographer to use a different technique at some point to gather evidence--shooting from low, high, or varied angles, from behind the subjects, over the shoulder, from the torso with preset exposure and distance. Whatever sampling devices are used, photographers need to identify the photographs by date, time, film roll and frame, and place, in addition to describing the overall sampling strategy.

Time-Based Sampling

In this type of sampling, the viewpoint and spatial coverage of the camera are fixed and photographs are taken at regular time intervals, sometimes ranging from one frame per second to one frame per minute. One method of collecting data with this method is to use a 16mm movie camera fitted with an extreme wide-angle lens (often covering a whole room), and an intervalometer. Alternatively, a 35mm still camera can be used, fitted with a bulk film magazine, motor drive, extreme wide-angle lens, and intervalometer. The advantage of the movie camera is that the resulting film can be projected as a time-lapse movie, thus showing motion patterns and changes in the spatial distribution of persons in the environment. On the other hand, time-based photo sequences taken with the 35mm still camera can be examined minutely for such details as eye contact, and prints can be measured to quantify the proximity of subjects to one another.

An advantage of time-based sampling is that it accurately reveals shifting patterns of persons in space over time. As such, it can be extremely useful in studies of the use of space

and also can provide information on the changing relations between groups and between members of groups. A disadvantage of this method is suggested by Goffman's (1976) observation that human interaction is largely ceremonial, being concentrated in liminal events: collecting data on a constant time base may tend to exaggerate the importance of the large proportion of "inactive" time that tends to separate such liminal events.

Shadow Sampling

This method involves following a single subject through the program, recording the experiences and interactions of that individual. An advantage of this method is that the photographic data collected will all share a common independent variable: the individual being shadowed. This is of course also a disadvantage in that the individual chosen for shadowing may introduce systematic bias into the data through the types of interactions and situations in which she or he typically and habitually engages (or does not engage). Taking this viewpoint, shadow sampling may result in collecting data about the individual, rather than about the program. This problem can be overcome to some extent by shadowing several subjects, either simultaneously or consecutively. However, simultaneous shadowing generally requires multiple photographers, which is likely to be very obtrusive, while consecutively shadowing several subjects through a program of any length may require unrealistic amounts of contact time. The payoff is description of a participant's experience.

Blanket Sampling

This method does not constrain the photographer to follow a given session or event through to completion. Rather, the photographer attempts to cover as much of the entire span of events and sessions as possible by moving about freely, and fairly constantly, from location to location. When this method is followed, it seems likely that the photographer will gather a

rather large proportion of liminal events, generally at the expense of sequences showing development of action, changes of groups, shifts in proxemics, etc. Basically, this is the methodology of traditional photojournalism, and the fact that it tends to gather only liminal events probably accounts for both the strong impact and the uncontrolled biases of most photographic documentaries.

Event-Based Sampling

Sometimes the research question posed for a study is not concerned with the program or system as a whole, but with a particular type of action, interaction, sequence, relationship, or event within the overall context. In such cases, the photographer may be assigned to sample as many events as possible within a certain category. Such categories may be relatively broad ("question-and-answer periods," "peer teaching at terminals"), or specific ("handshakes between persons of the opposite sex after the presentation"). Whatever the category, event-based sampling is generally appropriate in response to specific questions or program issues that are emerging. It should probably be accompanied by some more global technique (e.g., blanketing the event area, having another person take field notes, tape recording) in order to provide contextual information for interpreting the category of specific events.

Dimensionally-Based Sampling

The development of a dimensionally based sampling procedure for the EN Conference evaluation is described elsewhere. However, the basic principles of this type of sampling will be outlined here for ease of application in other circumstances. Dimensionally based sampling would appear to be useful where the initial aim of the study is descriptive appraisal, but the constraints of time, space, and work force make it impossible to cover all events in the program. Any information available about the program (field notes, previous reports, informants' reports,

printed programs, informational brochures, etc.) is examined to determine a set of apparent dimensions for classifying the events and components of the program. Events are then selected for photographing to represent the largest possible range of dimensions and combinations of dimensions. Other constraints, such as photographing a whole event, or spending a predetermined amount of time at each event, may also be imposed.

The advantage of this sampling procedure is that it offers some guarantee of representativeness in the description of the program. It should be noted, however, that, in a photographic study of any length, this method will usually need to be progressively modified during the course of the study to reflect the specific program questions that arise as a result of analysis of the photographic data. Once it has been established that the data collected are truly representative of the program, then it may be appropriate to initiate more specific event-based sampling to study apparently significant or pivotal aspects of the program in greater depth.

Dealing with Reactivity

The traditional concept of reactivity refers to the influence of the observer's presence on the behavior of participants in the program. It raises the question of whether the events observed and recorded by the photographer are an accurate reflection of ordinary behavior or a result of the photographer's presence.

In social documentary inquiry, the camera is considered by Becker (1974, 1979) and Collier (1967) to help reduce reactivity. They argue that carrying a camera helps validate the investigator's right to be there. People generally want their pictures taken, whoever the photographer is. Under many circumstances, being observed and photographed is commonplace, expected, and accepted. At least people know specifically what kind of data an observer is collecting with a camera, even though the presence of the camera may produce some anxiety at first.

The camera is an obtrusive instrument for gathering evaluation data. The camera is not easily ignored, and, even if they do not do so deliberately, people do react to its presence. This may be true of observers in general, of course, and the fact that reactivity occurs in response to a photographer is not a very unusual or difficult problem. The camera may actually be part of a strategy for the evaluator entering the situation. It may help an evaluator gain access to the situation because the presence of a person using a camera is largely self-explanatory. Yet, the camera forces immediate explanation and interaction between the photographer and the participants. In general, a person photographing for an evaluation study should have a prepared explanation for his or her presence: it should be brief and matter of fact, much like the sort of prepared statement a survey interviewer uses as a preface to an interview.

Becker (1974, 1979), Collier (1967), and Walker and Wiedel (1979) claimed that the camera facilitates the photographer's access and helps in developing trusting relationships between the participants and the photographer. The kind of relationships developed are closely related to how revealing the data can be and to the kind of interpretations that are possible in a study. This is particularly true in photo-interviewing when photographs are shown back to subjects for purposes of interviewing them about what has been depicted. When and where the photographer is able to put himself or herself in relationship to the subjects indicates the trust that has been established. The social and physical distance between participants and photographer, and the position from which photographs are taken indicates whether the photographer has taken the role of observer or participant.

The presence of the photographer does not change anyone's behavior in the long run because observing and photographing become part of the scene. The reactive effect may be of surprisingly short duration. In many situations, people being observed are engaged in ordinary activities that are important to them. They could not change what they are doing for an observer even if they wanted to.

It is important to bear in mind that reactivity itself often produces a significant form of data. How people react becomes one part of the photographer's exploration of the program, and facilitates the evaluator's relationship with participants. The reaction of participants to the intrusion of an observer tells us much about how the participants feel about the situation in which they are involved. Different types of reactions to an observer or evaluator may indicate that the subject is under stress or is comfortable with the situation, for example. In the case of photographic observation, the very action that produces reactivity--taking pictures--also records information about reaction and preserves it for later analysis. The photographs become a record of the photographer's relationships with the people he or she photograpns (for example, in Owens, 1973; Banish, 1976; Meiselas, 1975).

The actual act of photographing need not be highly obtrusive. With modern films and equipment there is no need to use flash under the lighting conditions found in most offices and classrooms. If there is much activity going on, the noise of the camera will usually not be very noticeable and photographers, like any other type of observer, can learn to move about in the situation without calling undue attention to their presence. (In fact, the skill of entering a social situation gracefully without disrupting it and to remain unobtrusive is a skill that most documentary photographers must develop in order to carry out their work successfully--just as an evaluation observer must do.)

Reactivity often reflects the program participants' apprehension and fear about what will be done with the information being gathered and photographed. The observer must give evidence that the participants will not be put in jeopardy. In some situations administrators may want participants to sign release forms, and participants may prefer to sign release forms establishing the photographer's right to be there. Standard release forms are available in photograpny stores.

Collecting the Data

Talk with clients, program staff, audiences

Assemble photos, narrative materials for report

Select sampling method

Select instances to photograph

Rephotograph, repeat process

Develop program issues

Validate, confirm attempt to disconfirm story, issues

Select photographer(s)

Go back, photointerview, interview, observer, rephotograph, gather verbatim data, repeat

Discover concerns of constituents, audiences, information needed

Select representative pictures, focus issues, topics

Obtain permissions to photograph

Photograph mapping shots, detail and close-up shots

Negotiate access with camera

Begin taking many pictures

Adapted from Stake (1975, 1980); Becker (1974, 1979); Guba and Lincoln (1981); Collier (1967, 1979).

The data collection process is circular in nature, events occurring in differing sequences from one evaluation study to another. The photographer enters the process at any point in these prominant events on the handless clock, usually at 12 o'clock.

Establishing Validity

In evaluation with photography, validity has to do with two fundamental issues: establishing that the photographs are trustworthy evidence and that they reliably and accurately represent the program under study. Photographs convey a sense of truth, but they can misrepresent reality if they are distorted.

Threats to Validity

Photographic evidence can easily be distorted in several ways: by alteration of the photographs, by artistic intent of the photographer, by inadequate sampling of the program, and by censorship of the photographs (Becker, 1974, 1979). These four threats to the validity of evaluation with photography will be discussed here, and then strategies will be offered for affirming the validity of an evaluative study.

Altered photographs. The most obvious threat to the validity of inference based on photographic evidence is faking or doctoring the photographs in some way. Alteration includes retouching, cropping prints, using composite negatives, using models, arranging or staging the scene, and the like. These are ways of changing or excluding information so as to distort important content.

Artistic intent. The photographer may distort images for artistic purposes. The desire to make art may lead photographers to suppress details that interfere with their artistic conception. This practice is acceptable in other contexts, but it makes the photographs unsuitable for use as evidence in evaluation. Some of these distortions may be readily detected by examining the photographs. For example, high or low angles of view can give a distorted impression of the relationship between people, between people and the environment, or can misrepresent the people themselves. The use of a wide-angle lens may give the impression that objects and persons are thinly scattered in the environment, whereas a telephoto lens tends to produce the opposite effect, that of bunching subjects together. Dim

lighting and blurred images tend to obscure information. There are other ways besides these of making artistic photographs; in evaluation, natural, uncontrived photographs provide clearer information.

Inadequate sampling. Inadequate sampling can bias the picture of reality that emerges from the photographs. Without a sampling plan, a photographer could take many pictures but still not obtain a representative sample of the people and events in the program being evaluated. Without a plan, the photographs may not capture adequate representations of people's faces, spatial relationships, and social interactions. Furthermore, evidence about the physical settings in which programs take place can be easily distorted if the settings are not amply photographed.

An important cause of inadequate sampling is limited access to the program. Without full access to the setting and people, the photographer may not be able to take pictures of the full range of activities in the program. Another cause of inadequate sampling is the failure to raise the issues in the program or to use some telling theory to guide the interpretation of photographs from day to day. Which images have meaning is determined in part by the program issues that are being raised during the evaluation. Without program issues, the photographer may tend to take pictures only of what is of personal interest to the photographer.

Censorship. Censorship limits the pictures the photographer can take. Censorship may be imposed in a number of ways, but in evaluation the greatest threat censorship can make to validity is the compromises the photographer may have made in negotiating access to the program--for example, denial to photograph people's faces, or have access to certain meetings, events, and records--anything someone may not want known. Such aspects might be vital to a full appraisal of the program. If some form of censorship limits the photographer's access to any part of the program, then the audience of the evaluation will be prevented from obtaining certain information about the program. Whatever has been withheld may be pertinent to representing some

perspective of the participants that might substantially change the interpretations that can be made of the photographic evidence.

Strategies to Affirm Validity

Establishing the validity of photographic data is accomplished in much the same way as for other types of data--by specifying the conditions of data collection and adhering to the procedures for reducing threats to validity. Specifying these conditions in the final report should be a standard part of any photo-assisted evaluation.

There are several important strategies for affirming the validity of photographic evidence. By using these strategies, evaluators attempt to achieve fair representation of the program by overcoming the major threats to validity that were outlined above. The strategies for establishing the validity of photographs in evaluation include:

Cross checking photographs with participants

Representing multiple perspectives

Following a sampling plan

Establishing continuity of time

Keeping complete records

Leaving photographs unaltered

Gaining full access to the program

Staying on-site as long as possible

Using multiple methods

Each of these strategies will be described briefly here.

Cross checking photographs with participants. Cross checking evidence is the most important method of establishing the veracity of photographic evidence. It should occur periodically and continue throughout an evaluation study. The basic notion of cross checking is that the program's constituent audiences have the right to provide feedback to verify, modify, or reject the evaluator's photographs and other findings.

Cross checking is similar to the concept of triangulation in navigation--getting a fix from three different physical points. In educational evaluation, cross checking the photographic and narrative evidence with at least three sources among the constituents--for example, the teachers, students, parents, administrators, specialists, etc.--is another form of triangulation that provides a reality test. Evaluators and photographers have an obligation to sift and classify information gathered about the program's issues and apply their analytic resources in interpreting the information, and then take it back to the informants for cross checking. The result may be a negotiation process from which more clear representations of people's differing perspectives about the program emerge.

The report should include a number of prints taken in the study. It should also include proof sheets for independent checking.

Representing multiple perspectives. A key strategy in a photographic evaluation involves the question of whose perspectives on the program is being represented. Each group of constituents may represent varying points of view about a program. In the interest of thick descriptions and fair representation, the photographer and evaluator should present the differing views. Without a range of views, the evaluation may be biased to the extent that both description and interpretation are limited. A more full description represents the views of different people even if they are opposing views. The process of gathering these multiple perspectives is compatible with the process of cross checking the issues. Both photographic and narrative reports of information about program issues need to represent the many perspectives in fair proportion. For example, in Serrano's Western City evaluation (1978), a letter of disclaimer was included to represent an administrator's perspective that opposed Serrano's perspectives represented in photos of racially segregated students.

Following a sampling plan. At the outset the sampling plan selected is a method of directing the photographer to represent

events and participants in the program in a way that provides a fair picture of what is transpiring. The intent is to assure that sampling and data collection have been sufficiently extensive so as not to be biased on the side of representing only the photographer's and evaluator's perspective.

Establishing continuity of time. This refers to methods for accounting for how much time was spent on-site and the order of sequences in photographs. There is nothing inherent in photos to indicate time, but we infer a sense of time indirectly. When we view a sequence of pictures, we assume that they were taken in the order in which they appear. The longer the photographer is on-site the more we tend to trust the photographs. For example, Owens spent two years on the site taking photographs for Suburbia. By keeping an accurate log, records of film exposed, and presenting proof sheets, the photographer can disclose continuity over time. This is important for making inferences and comparisons of photos. The major result is to assure the reader that the coherence implied in a sequence of photos is not contrived by biased selection, but rather accurately represents events that occurred in order over time.

Keeping complete records. This refers to providing a reasonable if mundane way of establishing the credibility of photographs and reducing doubts. Keeping a log of film exposed provides a basic record of the organization of the photographic work--dates and location where film was shot, number of rolls exposed, prints made and selected, subjects photographed and interviewed. By disclosing record-keeping procedures, the reader should be able to determine that all types of data have been reliably collated and, hence, that errors in interpretation have not arisen from faulty record keeping. The reader should have adequate indications of the number of exposures made and the time period covered, and should have access to proof sheets or raw data if possible. The report should also make clear any gaps in the photographic coverage.

Leaving photographs unaltered. Photographers must decide on ways in which they are going to present photographs, whether by

whole frames, keeping track of sequences, and eschewing technical altering such as cropping. They need rules for handling sampling and rules for data. Altering photographs used for evaluation purposes would not appear to be much of a problem because of the rigor of methods applied. Evaluators can reduce error and bias and increase the informational value of photographs by not altering or distorting them. Evaluators should disallow and avoid using cropped photos, faked subjects, posing subjects, staging props and physical arrangements, out-of-focus prints, extreme lighting, selecting distortions of subjects, and any other form of altering what is pictured, omitting legitimate evidence, or compromising information in the prints.

Gaining full access to the program. Negotiating access to the program is of key importance. Agreements about what people and settings will be available or restricted to the photographer determine much about the quality of evidence. Having restrictions implies that certain information is going to be compromised or not available. Excluding, inhibiting, and censoring certain kinds of information can seriously bias the evaluation and the kinds of inferences that can be made about photographs and interview data.

The evaluator should be able to photograph and interview as wide a variety as possible of constituents in the program, including students, teachers, parents, specialists, administrators, consultants, other evaluators, and taxpayers in general. Having obtained permission to move freely about the site, the photographer should also have unrestricted access to all of the program's environment.

Staying on-site as long as possible. The longer the photographer has access to events, people, and spaces to photograph, the greater the power of description and the credibility of the photographer, and the more likely the appraisal can inform decision makers about what occurs in the program. Staying longer increases the accuracy and stability of interpretations and assertions made about photos. But time is often short in evaluations because of budget restrictions and

design requirements. Documentary style of photography is more credible the longer the photographer has time to make photographs and interview participants. Nevertheless, when a longer time is not possible, observing other strategies for establishing validity can improve the quality of evidence.

Using multiple methods. This refers to gathering as many kinds of relevant data as possible from various sources in the program, using a combination of methods. Photographs alone are not sufficient for most evaluations.

An unusual example of a photographic evaluation using 35mm color slide photographs only is Bernadine Stake's 1973 evaluation of a children's arts program. The evaluation audience required that pictures be taken of the teaching methods and processes children were learning for handling eight major art media. The lack of multiple methods was made up by three other factors: the long time she spent on-site (an academic year), the large number of slides taken (1600), and the weekly reporting meetings with program staff. Each week the staff viewed all slides taken the previous week to interpret for themselves the evaluation results.

In addition to photographs, other methods to employ generally are observing, interviewing, document analysis, and surveying. Taking narrative notes, interviewing, audio recording, and photo-interviewing are essential methods of describing a range of program elements. Photographs and scenarios can be used as projective instruments. Demographic and survey data will be helpful in fleshing out the photographic data. Pertinent historical records, project proposals, written materials that pertain to the subject matter, curriculum guides, schedules and the like will all reveal important information to provide fuller program description than photographs alone. A variety of methods produces these materials. Final reports should reflect these multiple methods and their results.

Interpreting the Data

This section suggests several methods evaluators might choose for interpreting groups of photographs, depending on which seems appropriate for a particular study. The main idea is to discover themes, patterns, and issues by grouping photographs that go together to provide the primary supporting evidence.

The interpretation of photographic evidence suggested here implies that generalizability is a matter of logical inference that is plausible and validated against experience (Stake, 1980), rather than causal explanations validated with empirical proofs. The logic of inference depends in part on the kinds of questions asked. The questions emanate from ideas about what the investigator anticipates finding, is finding, and is analyzing about in the situation under study.

How do we make sense out of so many photographs and find meaning in the ones that are selected? Program issues and telling theories (held lightly, to not confirm theories but to guide inference making) help structure the study, and shape the procedures for sampling, collecting data, and interpreting the results. The program issues direct the photographer to whole classes of information in the photographs. The photographer looks for alternative interpretations to reformulate the interpretation, meanings that may emerge suggested by the data about what is happening.

The basic idea is to clarify how the photographer thinks things really are, and to present photographs that use imagery as evidence for inferences and assertions that have developed (Becker, 1979). Broudy (1979) contended that images are the first news of knowledge and the basis of concept formation. The interpretation made is a function of the issues as they are found and cross checked in photographic and narrative data, and the kinds of questions asked of the data.

McCutcheon (1981) described three types of interpretion in qualitative inquiry that seem to be useful ways of thinking about photographs. They include looking for patterns that form; social

meanings as interpreted by insiders (program participants) and outsiders (the photographer/evaluator); and relating observed internal events to various external factors.

As a way of inferring social statements about photographs, Becker (1974, 1979) raised a list of sociological questions that can be answered photographically in the field. He cautioned that answers do not come all at once, but through a process of progressive refinement and constant testing against new information that contains visual counterparts.

1. What are the cast of characters and status groups?
2. What expectations does each kind of person have for norms, rules, or common understandings?
3. What are the typical breaches, deviance to rules?
4. What sanctions or conflict resolut_ons occur when expectations are violated? (Becker, 1974)

Seeing an instance of one of these concepts alerts the photographer to look for other visual counterparts of the interpretation.

Collier (1967, 1979) contended that there are two levels of classifying involved in the inferential process. The first level of classifying is a descriptive account that counts, measures, and tracks materials, elements, and cultural/social arrangements. The second level of classifying is an interpretive account, identifying and evaluating the overall patterns of the subgroup culture or situation under study, based on available data. This correlation is made not by counting or measuring but by the photographer's making judgments about the visual evidence of personality, behaviors, and the character of the situations. Developing, disconfirming, and confirming the validity of such judgments is accomplished through photointerviewing subjects, using the provocative quality of pictures as the interpretive key to situations; and then through the photographer's calling on his or her own judgments to clarify how the photographer thinks things really are, to express inferences and assertions that have been informed and stimulated by the multiple evidence that has been gathered.

Because we must select from the great number of photos taken, the interpretative task is basically a procedure of classification and sorting photographic evidence. The attempt to answer the kinds of questions cited here is interwoven with further photographing in a process of simultaneous data gathering, analyzing, and reconceptualizing that begins with the first selections of pictures as they pertain to program issues, and continues throughout the evaluation. Making valuations of worth, locating strengths and weaknesses in the program are not reserved for the final analysis only, but are embedded throughout the photographing/evaluating process. The point here is not to be pedantic or formalistic by neatly fitting pictures into categories, but to grasp meanings so as to quicken insight and inform understanding about the program. Selecting and grouping photographs around common themes and issues build the categories for which the photos are primary data, supported by narrative data. These categories also structure the report.

Development of the interpretation is both a tentative and ongoing process during the on-site phase of the study. The final part of the process draws together the various types of data collected and unites them with the overall system of description that has been evolving through progressive focusing of initial program issues. Gathering data, both narrative and photographic, and making judgments about the description is close to Geertz's definition of thick description: description layered with interpretations and judgments.

From the standpoint of how this applies in a report using many photographs, the key is that the logical inferences made from photographic evidence must be accessible to the reader, in more or less the same way that inferences from quantitative data are presented in a form that allows a reader to be assured of the strength of the inference. In the case of photo-assisted evaluation, this task may appear as a clear, narrative explanation of the story, or as lengthy summaries of issues from observations or interviews with participants, or as statements

letting participants speak for themselves, that take on the form of title and captions for the photos.

Reporting the Evaluation Using Photographs

The transformation of photographic data into project results is often less clear and dramatic than the transformation that quantitative data undergoes. A photograph appearing in the final report is, after all, physically the same as a photograph in the mass of project data. The difference is that the selection of photographs for inclusion in the report is performed as a means of achieving economy of representation, while still providing examples of data that will support the inferences made in the report.

Project reports based wholly or partially on photographic evidence must often differ physically from traditional reports. Ordinarily, project reports are simply the final, typewritten copy of the results, reproduced in as large a quantity as necessary by whatever means available (mimeograph, xerography, spirit copying, offset printing, even carbon paper). The inclusion of photographs immediately limits the processes that can be used, and in any case multiplies the cost of producing a report. The standard format of reports (letter size, or 8-1/2 X 11 inches) is also less than ideal: Larger pages would make it easier to present groups of photographs together (for comparison or sequence), with the narrative interpretational material kept close by, for the reader's convenience. However, any non-standard format will multiply production costs, drive librarians to distraction, and perhaps reduce readership because the report looks unwieldy or unprofessional.

Cheatwood (1979) identified three ways of presenting photographs: the slide presentation, the book, and the mounted show or gallery display. The book format is organized into traditional essay, paper, report, or book in which photographs are mounted, pasted, printed, xeroxed, or overlaid on pages which

include to greater or lesser degree some narrative text. That is, numbered photographs are arranged, ordered, and grouped in meaningful ways that tell a story. They are accompanied by text and titles. The best negatives for this format come from cameras that produce 35mm and 2-1/4 inch negatives.

For some purposes, of course, a hard copy report is unnecessary, in which case the photographic data may need to be incorporated into a presentation. Black-and-white negatives can be converted readily to black-and-white slides by contact printing the strips of negatives onto strips of what is known as positive print film. The process is fast and inexpensive and results in slides that can be mounted for projection in a standard 35mm slide projector. Properly sequenced and identified, the slides can then be used both to illustrate and support the interpretations in a presentation of the project results.

It would also be possible to combine aspects of the written report and the slide show presentation. The test of the report could be presented in the normal, printed fashion, accompanied by a Carousel or other magazine of properly sequenced slides. The written text would contain indications of slide numbers for the reader to project and examine while reading. If only a few copies of the report were to be produced, this format might actually be less expenisve than providing a set of original photographic prints in each copy. Some readers may also find it easier to examine the large, projected image than to examine a print, especially if the prints have been kept to modest size to save space and printing costs.

Whatever format is chosen for the final report or presentation, certain criteria need to be met in order to achieve clarity:

1) Photographs and the narrative relating to them must be kept in very close proximity to each other, preferably on the same page or facing pages. This is standard practice in book design, but it must be observed very closely in photo-assisted studies, because the reader must be able to grasp photographic and verbal interpretation together.

2) Photographs must be reproduced with sufficient size and sharpness so that the inferences made in the text can be verified by the reader by examining the photographs. If original prints are included in the report, this will usually not be a problem, so long as the prints are not miniscule. However, if the photos are printed as halftones along with the text, the photographs will usually have to be larger, and it will be necessary to have the printing done on a good grade of paper, using a fine halftone screen (100 lines per inch or finer).

3) A figure numbering system must be used so that the photographs can be referred to in the text. If the report also includes extracts from field notes and photo-interviewing sessions, then the photographs may also have to be identified by roll and frame number, or whatever system was used to identify them during the course of note-taking and interviewing.

4) Narrative text and photographic data may not be themselves be sufficient content for a report. In order to establish the validity of the photographic evidence and complete the description of the research methodology, it may be necessary to include additional documentation. Complete contact sheets, tables correlating film exposed by subject and date, sampling plans, photographing protocols, and photo-interviewing protocols may need to be included or described in summary form in order for the reader to validate and accept the interpretations of the photographic evidence.

The final results of photo-assisted evaluations are quite likely to be bulkier than reports generated from other types of data, for two reasons. First, photographs as results do not condense data in the same way that tables, graphs, and statistics can be said to condense their quantitative antecedents. A photograph, however used or in whatever context, remains an extended, nondiscursive representation, in an analog rather than a digital mode, a point from which verbal inferences and descriptions expand rather than toward which numerical contract. Thus, although a picture can be said to be "worth a thousand words" for descriptive purposes, it may also serve to generate thousands of words as we tease out inferences from pictorial information and struggle to convert nondiscursive symbols into

another system of representation--language--which is also symbolic, but discursive in nature.

And this is the second reason that photo-assisted evaluation may appear uneconomical in its results. In the verbal interpretation of visual information, we are still in our infancy. In most stances we have no shorthand notation to render our inferences and descriptions verbally compact. Two notable exceptions are notations for kinesics (Birdwhistell, 1970), and dance notation. For the most part, our inferential/descriptive language is a mixure (and not always systematic), borrowing from the vocabularies or art history, aesthetics, literary criticism, philosophy, and, at times, the figurative language of the poetic tradition. From one aspect, it is a bulky system of representation, but from another it may be seen as a means of bringing us closer to the realization of what Stake (1975a, 1975b) called responsive evaluation--evaluation that provides needed information for all concerned by portraying interactions rather than outcomes, and by representing multiple perspectives from within the scene. In the long run, an evaluation methodology incorporating photography may be one of the richest and most sensitive means of achieving this goal of responsive evaluation.

Summary

This handbook has described important elements of a method of photographic inquiry for evaluation. What it tells evaluators is that to incorporate photographic methods is of minimum threat, and does not require wholesale revision of the process of evaluation. Rather, to add photography would require only an expansion of existing evaluation methods with photography.

More attention appears to have been given to problems of various threats to validity and sampling plans. This does not mean that other elements of method are not important considerations. The attention given here reflects the attention given to these matters in the literature of photographic

inquiry. Other methodologic elements need to be developed by evaluators as they adapt photographic methods. For example, the problem of history is of prominent concern, especially since I advocate staying on the site as long as possible to collect data and interpret it. The fact that we can discuss such elements in evaluating with photography attests to the possibilities for its congeniality with other evaluation methods.

The emphasis in this handbook is on the aspects of educational evaluation dealing with questions about what transpires in the program. How useful photography is to evaluators may be viewed as a function of how important they think descriptions and interpretations of program operations and activities are rather than learning outcomes. The descriptions of events, activities, and social interactions in a program represent pictures of the social organization of the curriculum and learning conditions. Using direct observation with a camera in natural settings, Goffman (1980) argues that we can photograph social interactions but not organizations. He contends that it is in small social interactions that people organize perceptions and derive meanings from their experiences. Translated to educational evaluation, such a view can provide a method for interpretive appraisal of the program's interactions.

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